

Heindel and Noyes

P.O. Box 64709 Burlington, Vermont 05406-4709

• Consulting Hydrogeologists
• Engineers
• Environmental Scientists

802-658-0820

Fax 802-860-1014

March 24, 1997

Andrew Shivley
Sites Management Section
Vermont Agency of Natural Resources
103 South Main St./West Office Building
Waterbury, VT 05676

RE: Town of Bennington
Willow Road Highway Garage
Bennington, Vermont
Site #96-2041

WASTE MANAGEMENT
DIVISION

MAR 27 11 59 PM '97

Dear Mr. Shivley:

Heindel and Noyes was contracted to perform further investigations for the Town of Bennington, following closure of a 1,000 gallon gasoline UST and discovery of petroleum contamination at the Town Highway Garage on Willow Road on July 15 and 16, 1996. A USGS site location map (Attachment, page1), and an area map (Attachment, page 4) are provided. This investigation follows our work plan dated October 18, 1996, submitted to Chuck Schwer at your office, in response to his letter to Joseph Sokul, Public Works Director for the Town of Bennington, dated September 30, 1996.

In his letter, Chuck Schwer requested that the Town retain a consultant to perform the following tasks:

- Further define the degree and extent of contamination to soils;
- Determine the degree and extent of contamination, if any, to groundwater;
- Determine the potential for sensitive receptors to be impacted by the contamination;
- Determine the need for a long-term treatment and/or monitoring plan;
- Develop a plan to treat and/or monitor the 250 cubic yards of contaminated soils stockpiled following removal of the UST; and,
- Submit a summary report to the SMS outlining the work performed.

Our work plan covers all of these tasks, and was approved by you in your letter to Joseph Sokul dated November 14, 1996.

This letter report summarizes our findings, conclusions, and recommendations following further site investigative activities at the Willow Road Highway Garage site.

1.0 INTRODUCTION

The 1,000 gallon gasoline UST removed on July 15 and 16, 1996, was a single-walled tank that was approximately 20 years old. The tank was replaced with a 1,000 gallon above ground skid tank for the storage of gasoline. Details of the tank pull and tank closure assessment were provided by Toni King of MSK Engineering. A tank closure form and UST Closure Site Assessment prepared by MSK is attached (Attachment, pages 5 to 9).

2.0 INVESTIGATION OF SOIL CONTAMINATION

Over a two-day period on July 15 and 16, 1996 a total of 250 cubic yards of contaminated soil was removed under the supervision of MSK, in an excavation measuring about 16 feet wide (north-south) by 40 feet long (east-west) by 17 feet deep. No groundwater or bedrock was encountered. Considerable details on the distribution of contaminated soil were obtained during the tank pull by careful screening of soils with a PID. After removal of the approximately 250 cubic yards of soil, the remaining PID levels averaged 45 ppm in samples from the walls of the excavation, with the highest levels observed on the north wall of the excavation. Contaminated soil to the north could not be removed without threatening the structural integrity of the highway garage.

Fairly uniform soils were observed in the excavation, consisting of light yellow-brown, silty, fine to very fine sands with pebbles, increasing in density from loose near the surface to moderately dense at the total depth of the excavation of about 17 feet below ground surface (bgs).

The removed tank was found to be in fair condition, with small holes near the eastern end of the tank. Some PID-detectable contamination was noted near the ground surface,

suggesting some releases from tank overfills. The highest level of contamination was reportedly observed near the east end of the tank at a depth of 6 feet below ground surface, just above a silty confining horizon. PID levels as high as 553 ppm were observed at the bottom of the east end of the tank, and the average PID levels in the vicinity of the tank were about 350 ppm.

All soils were stockpiled on plastic and covered with plastic (poly-encapsulated) on the approximately 4-acre parcel surrounding the Highway Garage. Stockpiled soil was laid in a long berm along the western edge of the property, as shown on the site map (Attachment, page 2).

To obtain additional information about soil contamination, our work plan recommended four borings with a hollow-stem auger drill rig, and collection of split-spoon samples at 5-foot intervals. On January 15 and 16, 1997, Tri-State Drilling and Boring (TSDB) performed this work under the supervision of Heindel and Noyes. An H-Nu photoionizable detector (with a 10.2 electron-volt lamp) was used to screen split-spoon samples. Samples were equilibrated in Ziplock bags and warmed to approximately room temperature before PID screening was performed. Detailed drilling logs prepared by Heindel and Noyes, and boring logs prepared by TSDB are attached (Attachment, pages 10 to 16). Sample PID levels are provided in the drilling logs.

Given the presumed groundwater flow direction toward the south to southeast, we planned to install one upgradient well at the north end of the Town Highway Garage, one downgradient well just south of the former UST tank site, and two additional downgradient wells further to the southeast. The locations of all installed monitoring wells are provided on the site map (Attachment, page 2).

Uniform soils were noted in all four borings, matching the soils encountered during excavation of the tank and surrounding soils: fine to very fine (occasionally medium) silty sands with pebbles. Refusal was reached at 21 feet below ground surface (bgs) in MW-1, either on bedrock or on a large boulder. This was the only indirect evidence of the possible depth to bedrock at the site. Depths to the water table varied from 8 to 13 feet below ground surface in the four monitoring wells.

PID levels were generally at background in all borings except MW-2, where a PID level of 5 to 7 ppm (benzene equivalents) was observed in the 15 to 17 foot bgs split spoon sample. This well is located 30 feet south of the former location of the gasoline UST, and 22 feet south of the southern limit of the soil excavation during the tank pull. With a presumed southerly groundwater flow direction, the nearest downgradient property line is 110 feet from MW-2.

3.0 INVESTIGATION OF GROUNDWATER CONTAMINATION

To assess the degree and extent of contamination to groundwater, 2 inch diameter flush-threaded, factory-slotted PVC monitoring wells were installed in each of the four borings. Well completion notes are provided in the drilling and boring logs. Each well was equipped with a 10-12 foot screen, surrounded by a sand pack and overlain by an approximately 2-foot thick bentonite seal. Flush-mounted curb boxes, cemented in place, were used to complete the wells.

On January 23, 1997, eight days after their installation, each well was gauged, checked for petroleum odors or sheens, then purged and sampled. No sheens or petroleum odors were noted in any of the wells. Water level information, coupled to a site survey were used to construct a water table map (Attachment, page 2). Based on our limited data set of four water level points, we observe a groundwater flow direction toward the south in the vicinity of the pulled UST. The gradient of the water table is approximately 4%.

Preserved groundwater samples were transported on ice to the laboratory for EPA Method 602 analyses for aromatic hydrocarbons, and for methyl-tert-butyl-ether (MTBE), a gasoline additive. All raw laboratory data and the chain-of-custody forms are attached (Attachment, pages 17 to 19). Contaminant distribution results are summarized on a site map (Attachment, page 3).

As expected from the PID levels in soils, the highest level of groundwater contamination was observed in monitor well MW-2, with a concentration of 740 parts per billion (ppb) benzene, and 5,217 ppb total BTEX (benzene, toluene, ethylbenzene, and xylenes). With the exception of a trace below quantitation level (TBQ) of < 1 ppb in MW-1, no other detectable benzene was observed on the site. Very low levels of other BTEX compounds

were observed in MW-1, MW-3, and MW-4. However, we also observed contamination from benzene (TBQ < 1 ppb), toluene (TBQ < 1 ppb), and xylenes (3.5 ppb) in the trip blank collected for this sampling round. Due to the trip blank contamination, we cannot say with certainty that the contamination observed in MW-1, MW-3, and MW-4 was actually derived from the groundwater, and not introduced into the sample during transport to the laboratory. It is therefore possible that only MW-2 contains any detectable contamination in the study area.

Methyl-tert-butyl-ether (MTBE) was absent from all upgradient and downgradient wells. This additive was first introduced into gasoline in the mid-1980's, so its absence suggests that the release or releases that caused the contamination may have preceded this date. We understand that there were never any other USTs at this location (interview with Roger Cross, Foreman, Willow Rd. Highway Garage on March 11, 1996). It is possible that the holes observed in the pulled tank developed from displacement of pebbles adjacent to the tank during the tank pull and tank cleaning, and that the tank was not leaking. The source of contamination may be from tank overfills or spillage that occurred prior to the mid-1980's. It is also possible that the 2,000 gallon diesel tank still buried at the site is the source of BTEX contamination in MW-2. However, PID levels in soils declined in the gasoline tank excavation toward the west, or toward the diesel tank UST location, so we suspect that this remaining tank is not the source of the contamination.

4.0 SENSITIVE RECEPTOR EVALUATION

During the tank pull and soil stockpiling activities, MSK Engineering learned from Town of Bennington employees that there are no public water supply wells or private water supply wells located within a one-half mile radius of the site. The nearest surface water body, Furnace Brook, is located 500 feet downgradient (south) of the former UST site (see area map: Attachment, page 4). We conclude that this brook was not affected by the leaking underground storage tank (LUST) due to its distance and the level of contamination observed.

Our sensitive receptor evaluation focused on any basements or crawlways that might be affected in nearby homes. The nearest resident downgradient of the leaking underground storage tank site is the home of Elizabeth Ann Dunham. Her home is labeled on the area

map of the site (Attachment, page 4), and is located 150 feet downgradient of the LUST site.

At 6:15 p.m. on January 17, 1997, I checked the basement of the Dunham home for PID-detectable volatile organic compounds. I found no PID-detectable compounds in the basement, despite the fact that a #2 fuel oil tank was located in the basement, with minor oil stains on the dirt floor below the tank. A sump pump, used to occasionally remove groundwater from the basement, also showed no PID-detectable contaminants. Mrs. Dunham had not smelled any gasoline odors in the recent past in the home, and I could smell no gasoline fumes during my inspection.

5.0 LONG-TERM TREATMENT AND MONITORING PLAN

Gasoline releases, either from small holes in the tank, or from overfill incidents, impacted the soils adjacent to the former UST site, evident from PID levels averaging about 350 ppm. However, after removal and stockpiling of about 250 cubic yards of contaminated soil, the remaining PID levels in the soils at the limits of the excavation averaged 45 ppm. In addition, PID levels in soils near the water table in MW-2, 30 feet south of the former tank site, ranged from 5-7 ppm, and dissolved phase petroleum contamination at MW-2 was about 0.5 ppm total BTEX, or possibly 1-2 ppm total petroleum hydrocarbons. There are no public or private drinking water wells within one-half mile of the site, and evaluation of the nearest basement to the LUST shows no impacts to indoor air.

There is no evidence of widespread contamination at the site, or direct impacts to sensitive receptors. The majority of the contaminated soil from the vicinity of the pulled tank has been poly-encapsulated. We recommend no further remedial action at this site at this time, nor do we recommend expansion of the network of monitoring wells. Additional information about contaminant distribution will be gleaned from the diesel tank pull, scheduled to occur before the deadline of June 30, 1998.

We recommend an additional round of groundwater quality samples to be collected in July 1997. A sampling round that includes a clean trip blank (which is customary during Heindel and Noyes' sampling trips) will provide some additional information about the presence or lack of contamination in MW-1, MW-3, and MW-4. One additional sample

from MW-2 will also begin to build a database on the temporal variations of BTEX compounds in this well. Future sampling rounds beyond the second sampling round may only require evaluation of MW-2.

6.0 MONITORING AND TREATMENT PLAN FOR STOCKPILED SOILS

The approximately 250 cubic yards of stockpiled soils at the west end of the Willow Road Highway Garage property must be properly maintained and monitored. The plastic cover over this soil pile was in fair condition during the mid-January 1997 site visit. The soils were frozen, so that PID levels could not be readily obtained from the soil pile. We recommend that PID levels be collected, and that the plastic be replaced on the soil pile as soon as the frost has left the pile. PID levels in the soil pile will be checked on a quarterly basis. We have arranged to have a local firm conduct these monitoring and maintenance activities as a cost-saving measure.

During discussions with Town of Bennington employees on March 5, 1997, we learned that the Town may elect to relocate the soil pile to a different spot on the same property. Following our recommendations, the Town may also add about 25% manure to the soil pile during its relocation, thoroughly mixing the manure with the soil. We recommended that old, well-composted manure be selected to minimize release of odors that may be offensive to nearby residents. We also recommended that perforated pipes be laid into the soil pile, and fitted with vertical standpipes to provide passive air entrainment into the pile and to enhance aerobic biodegradation of the gasoline contaminants. The Town is aware that the State refuses to apply PCF funds to costs associated with relocation of the pile, or the addition of manure or piping.

It should be stressed that the Town may elect not to relocate the soil pile, nor to perform any of the soil enhancement activities described above. However, the Town understands its obligation to have the poly-encapsulation regularly maintained, and to have the pile checked on a quarterly basis for PID-detectable contaminants. Once the contaminant levels have declined to below detectable PID levels, and no petroleum odors are present in the soils, they will be thin-spread at the Town Highway Garage property, following approval of the Sites Management Section (SMS), in a location least likely to be disturbed by vehicular traffic or by future excavations.

This completes our site investigation of the Town of Bennington Willow Road Highway Garage leaky underground storage tank site. Should you have any questions, please don't hesitate to contact me or Craig Heindel.

Sincerely,



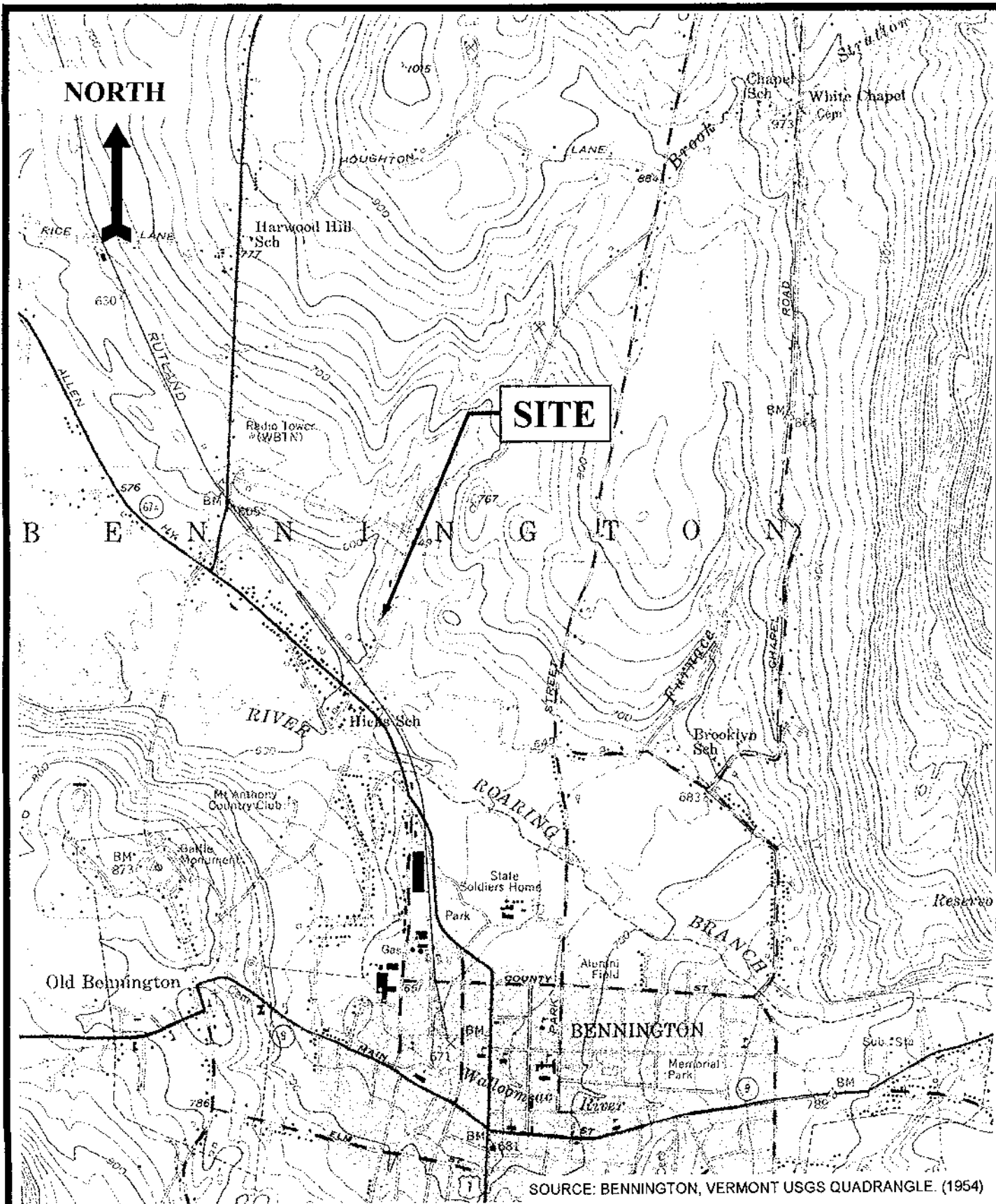
Dean A. Grover, P.E.
Chief Engineer

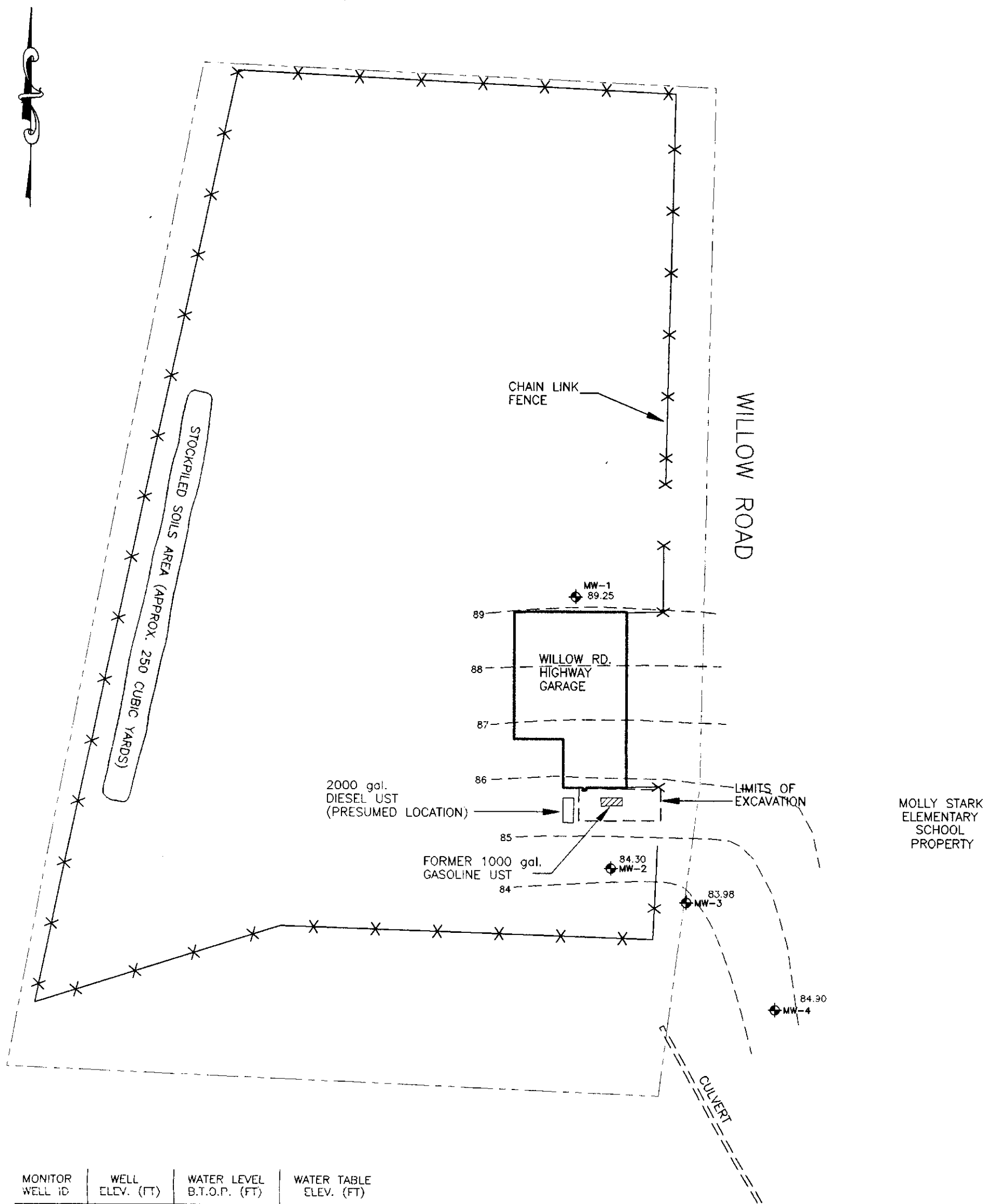
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Attachments

cc: MSK Engineering
Town of Bennington

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MONITOR WELL ID	WELL ELEV. (FT)	WATER LEVEL B.T.O.P. (FT)	WATER TABLE ELEV. (FT)
MW-1	100.00*	10.75	89.25
MW-2	98.13	13.83	84.30
MW-3	94.73	10.75	83.98
MW-4	93.12	8.22	84.90

BTOP = BELOW TOP OF PIPE
* ASSUMED BENCHMARK

LEGEND

MONITORING WELL WITH GROUNDWATER ELEVATION (FT)

GROUNDWATER CONTOURS (FT)

SOURCE: BASE MAP INFORMATION SUPPLIED BY MSK ENGINEERING.

TOWN OF BENNINGTON - WILLOW ROAD HIGHWAY GARAGE

BENNINGTON,

VERMONT

WATER TABLE MAP - JANUARY 23, 1997

SCALE: 1"=50'

FILE: C:\MSKWLOW\SITEPLAN

DATE: MARCH 12, 1997

PROJECT NO. 96236

DRAWN BY: M. Luman

PROJ. MGR: D. Grover

APPROVED: C. Heindel

☐ DRAFT

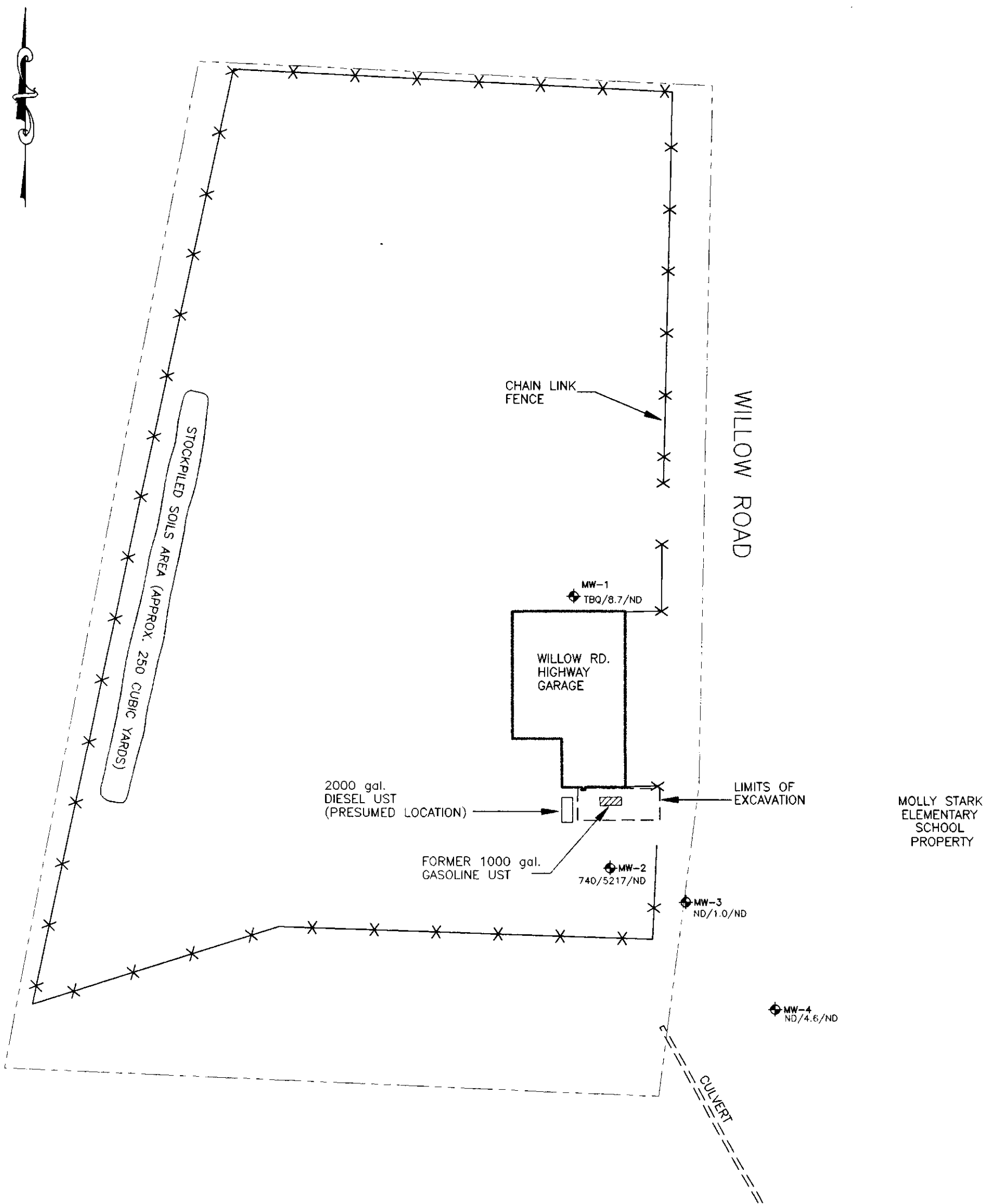
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Heindel and Noyes

• Hydrogeology • Ecology •
• Environmental Engineering •
CONSULTING SCIENTISTS AND ENGINEERS
P.O. BOX 64709
BURLINGTON, VERMONT 05406-4709

Prepared By:
Information & Visualization Services

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LEGEND

MW-1 MONITORING WELL WITH CONTAMINANT CONCENTRATIONS:
 740/5217/ND BENZENE/TOTAL BTEX/MTBE (ppb)

NOTE:
 TBQ <1 BENZENE, TBQ <1 ppb TOLUENE, AND
 3.5 ppb XYLENES DETECTED IN TRIP BLANK.

ND = NONE DETECTED
 TBQ = TRACE BELOW QUANTITATION LIMIT

SOURCE: BASE MAP INFORMATION SUPPLIED BY MSK ENGINEERING.

TOWN OF BENNINGTON – WILLOW ROAD HIGHWAY GARAGE

BENNINGTON,

VERMONT

CONTAMINANT DISTRIBUTION MAP (ppb) – JANUARY 23, 1997

SCALE: 1"=50'

FILE: C:\MSKWLOW\SITEPLAN

DATE: MARCH 12, 1997

PROJECT NO. 96236

DRAWN BY: M. Luman

PROJ. MGR: D. Grover

APPROVED: C. Heindel

☐ DRAFT

☒ FINAL

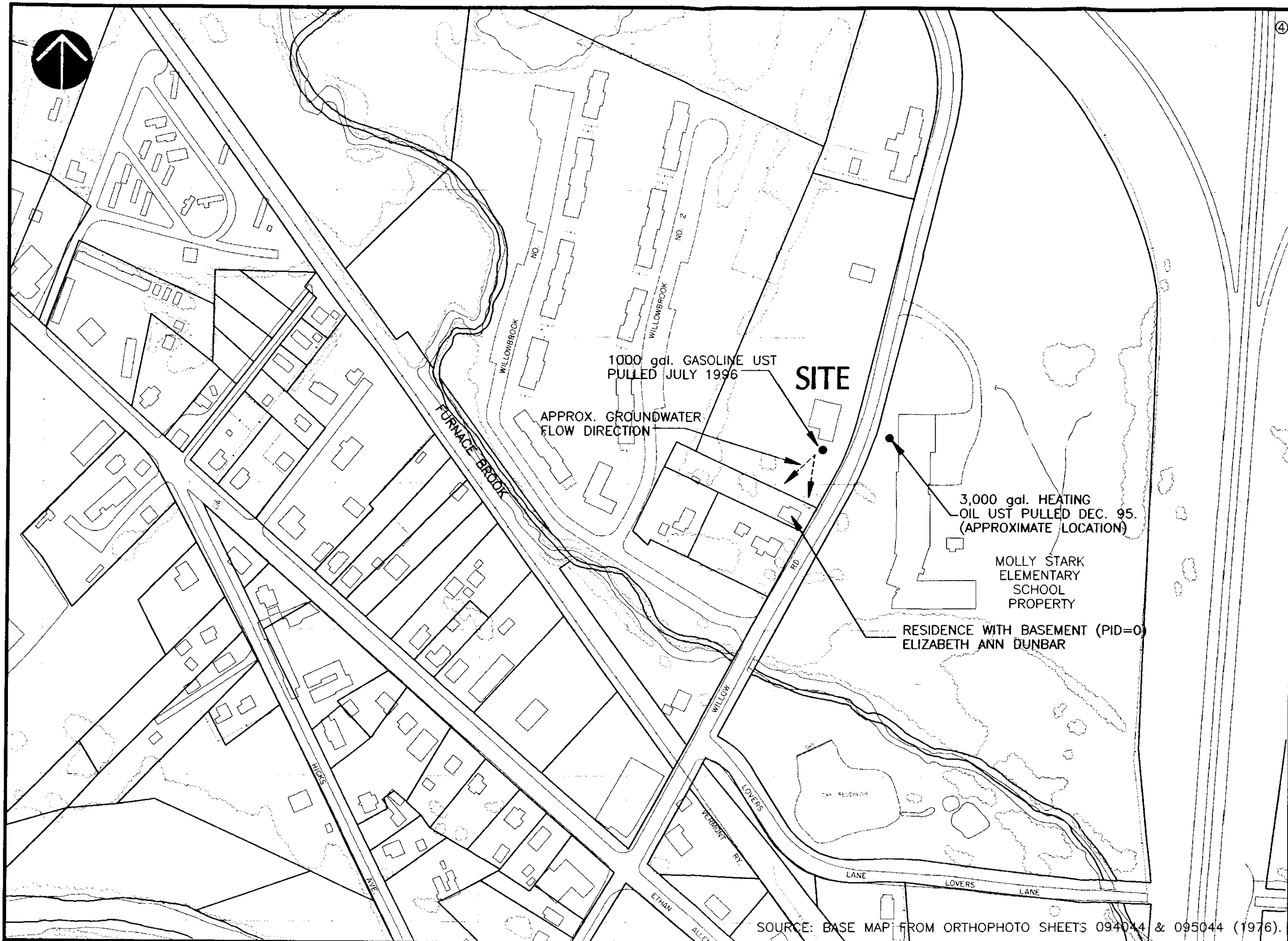
Heindel and Noyes



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 CONSULTING SCIENTISTS AND ENGINEERS

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 BURLINGTON, VERMONT 05406-4709

Prepared By:
 Information & Visualization Services



SOURCE: BASE MAP FROM ORTHOPHOTO SHEETS 094044 & 095044 (1976).

Heindel and Noyes • Hydrogeology • Ecology • • Environmental Engineering • CONSULTING SCIENTISTS AND ENGINEERS P.O. BOX 64709 BURLINGTON, VERMONT 05406-4709	
Prepared By: Information & Visualization Services	
DATE: MARCH 12, 1997	
PROJECT NO. 96236	
DRAWN BY: M. Luman	
PROJ. MGR: D. Dwyer	
APPROVED: C. Heindel	
<input type="checkbox"/> DRAFT <input checked="" type="checkbox"/> FINAL	
TOWN OF BENNINGTON - WILLOW ROAD HIGHWAY GARAGE	
BENNINGTON, VERMONT	
AREA MAP	
SCALE: 1"=200'	FILE: C:\MSKWILLOW\ORTHBASE

UNDERGROUND STORAGE TANK PERMANENT CLOSURE FORM

AGENCY USE ONLY
 Sched. Closure Date: 7-15-96
 Facility Name: BENNINGTON
 Loc. (ID): 005
 UST ID: ST (fixed)
 Evaluated by:

VERMONT AGENCY OF NATURAL RESOURCES
 DEPT. OF ENVIRONMENTAL CONSERVATION
 HAZARDOUS MATERIALS MANAGEMENT DIV.
 103 SOUTH MAIN STREET, WEST BUILDING
 WATERBURY, VERMONT 05671-0404
 TELEPHONE: (802) 241-3888

Company conducting
 site assessment: MSK
 Person conducting
 site assessment: TONY KING
 Telephone number of
 company (or person): 802-447-3340
 Date of UST closure: 5-16-96
 Date of site assessment: 5-16-96

INITIATIVE DATE ONE 15 DAYS PRIOR TO RESCHEDULE

This Closure Form may only be used for the facility and date indicated in the upper left hand corner. Changes in the scheduled closure date should be phoned in at least 48 hours in advance. Both the yellow and white copies must be returned to the above address; the pink copy should be retained by the UST owner. A written report from an environmental consultant covering all aspects of closure and site assessment, complete with photographs and any other relevant data, must accompany this form. All procedures must be conducted by qualified personnel - including training required by 29 CFR 1910.120. Documentation of all methods and materials used must be adequate. All work must be performed in compliance with DEC policy "UST Closure and Site Assessment Requirements" as well as all applicable statutes, regulations, and additional policies. The DEC may reject inadequate closure forms and reports.

Section A. Facility Information:

Name of Facility: BENNINGTON TOWN HIGH SCHOOL Number of Employees: 7
 Street address of facility: Willow Road
 Owner of UST(s) to be closed: Town of Bennington
 Name of Contact and telephone number if different from owner: Joseph Sokul, Public Works Director
 Mailing address of owner: 205 South Street, Bennington, VT 05201
 Telephone number of owner: 802-442-1037

Section B. UST Closure Information: (please check one)

Reason for initiating UST Closure: ☐ Suspected Leak ☐ Liability ☐ Replacement ☒ Abandoned
 Which portion of UST is being closed: ☐ Tanks ☐ Piping ☒ Tanks & Piping

USTs undergoing permanent closure. Include condition and if leaks were found:

UST#	Product	Size (gallons)	Tank age	Tank condition	Piping age	Piping condition
1	gasoline	1000	20 ± yrs	good/fair	same	good/fair

Which tanks, if any, will be closed in-place (must have approval from DEC) none

Disposition of removed UST(s):

Location: A. Aaron & Sons, Inc. Date: 07/15/96 Method: scrap Date: 07/15/96

Volume (gal.) and type of waste generated from USTs: none

Cleaning company (must be trained in confined space entry): A. Aaron & Sons, Inc.

Certified hazardous waste hauler (tank contents are hazardous waste unless recovered and usable product): A. Aaron & Sons, Inc.

Hazardous waste generator ID number: #000004597

UST not closed. This portion must be filled in to include all USTs, regardless of size, and status, *whether abandoned, "in use", "to be installed", or "not aware of any other tanks on-site". Remember: most new installations require permits and advance notice to this office.

UST#	Product	Size (gallons)	Tank age	*Tank Status	Piping Age	*Piping Status
2	diesel	2000	20 ± yrs	in use	same	in use

Section C. Initial site characterization:

Work in this section must be completed by a professional environmental consultant or hydrogeologist with experience in environmental sampling for the presence of hazardous materials. A full report from the consultant must accompany this form.

Excavation size (ft³): 640 Excavation depth (ft): 17 Soil type: sandy clay Bedrock depth (ft): none

ID information: Make: Thermo Environmental Model: 580B
 Instruments

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PID Calibration information: Date 15 JUL Time 0730 Type of Gas Isobutylene
16 JUL Time 0730 Type of Gas Isobutylene
Contamination detected with PID (ppm): xxx
Soil samples collected for laboratory analysis? Yes 553 Depth of peak (ft) 6 Avg. 6 553 range
Yes xxx # of samples xxx No x
show locations and depth of all readings and samples on diagram.

Have soils been polyencapsulated on site? Yes x list amount (cu. yds.): 250 No xxx
Have any soils been transported off site? Yes xxx list amount (cu. yds.): xxx No x

Location transported to: _____
Name of DEC official granting approval to transport soils: _____ Date: 7/1
Amount of soils backfilled (cu. yds.): none Avg. PID xxx
Have limits of contamination been defined? Yes xxx No x
Are you aware of any other contaminants which may be present? Yes xxx No x
Comments: _____

Free phase product encountered? Yes xxx thickness xxx No x
Groundwater encountered? Yes xxx depth(ft) xxx No x

Were there existing monitoring wells on site? Yes xxx (# samples taken xxx) No x
Have new monitoring wells been installed? Yes xxx (# samples taken xxx) No x
Samples collected from monitoring wells for lab analysis? Yes xxx No x
include well location, headspace readings, and laboratory results if applicable in a separate report and on the site diagram
Is there a water supply well or spring on site? Yes xxx (check type: shallow xxx rock xxx spring xxx) No x
How many public water supply wells are located within a 0.5 mile radius? none min. distance (ft): none
How many private water supply wells are located within a 0.5 mile radius? none min. distance (ft): xxx
What receptors have been impacted? x soil xxx indoor air xxx groundwater xxx surface water xxx water supply

Section D. Statements of UST closure compliance: (must have both signatures or site assessment not complete)

As the party responsible for compliance with the Vermont UST Regulations and related statutes at this facility, I hereby certify that all of the information provided on this form is true and correct to the best of my knowledge.

Joseph W. Fabal Date: July 18, 1996
Signature of UST owner or owner's authorized representative

As the environmental consultant on site, I hereby certify that the site assessment requirements were performed in accordance with DEC policy and regulations, and that information which I have provided on this form is true and correct to the best of my knowledge.

[Signature] Date: 07/18/96
Signature of Environmental Consultant

SITE DIAGRAM

Show location of all tanks and distance to permanent structures, sample points, areas of contamination, potential receptors and any pertinent site information. Indicate North arrow and major street names or route number.

see attached plan

Submit form along with complete narrative report and photographs to the Department of Environmental Conservation, Underground Storage Tank Program within 72 hours of closure.



ENGINEERING & DESIGN, INC.

PROFESSIONAL ENGINEERING: VT • NH • NY
CIVIL • ENVIRONMENTAL • MECHANICAL • STRUCTURAL • SURVEYING
SITE & FACILITY DEVELOPMENT • CONSTRUCTION COMPLIANCE • REGULATORY PERMITTING

SITE ASSESSMENT

PREPARED FOR THE TOWN OF BENNINGTON, WILLOW ROAD HIGHWAY GARAGE

UST CLOSURE OF 15 & 16 JUL 96

The site is immediately adjacent to Willow Road, and is encompassed by fencing and gates, leaving no access to pedestrians. To the north of the highway garage is a Bennington Rural volunteer firehouse. To the south exists a residential home, and to the east, directly across Willow Road, is Molly Stark Elementary School. Some distance from the site to the west, though common property lines are shared, lies Willowbrook housing development. Some 1100 to 1200 feet distant, across Willow Road and downgradient, the Recreation Department maintains an outdoor swimming pool. The area is served by municipal water and sewer. Outside of the intensive public use, there are no known sensitive receptors within this vicinity. See the accompanying site diagram indicating property boundaries, structures, tank locations, excavation, and monitoring point locations.

The Town of Bennington, aware of the impending 1998 upgrade requirements, has decided to phase in the removal of their unprotected tanks. This particular site was the home of a 1000 gallon gasoline tank, the documents herein reflecting its closure. There remains a 2000 gallon diesel UST on site, currently in use.

The tank closure was performed in two days beginning on July 15, 1996, a mostly cloudy day with occasional bouts of light rain throughout the day. The excavation was initiated at about 8:00 am by A. Aaron & Sons, Inc. This corporation was also responsible for the tank cleaning, and disposal/destruction, as well as the containment of all contaminated soil and other material from the site. The owner had arranged for Agway to disconnect and remove the gas pump. Upon exposure of the tank, no product was found to remain within. Excavation of the tank continued, and associated piping was removed, to be disposed of along with the tank. Soils that were found within this excavation site included 0" to 15" of processed gravel, with some mixed ground asphalt, 15" to 30" of yellow-brown sandy silt, 30" to 56" of greenish-gray friable sandy clay, 56" to 12' of yellow-brown friable silty clay, followed by an olive-gray clay, both firm and dense, to the limits of excavation of approximately 17'.

During the excavation, monitoring was performed via Thermo Environmental Instruments Model 580B PID, by Jim Davis of A. Aaron & Sons, Inc. Between surface and three feet in depth, initial readings ranged from 124 ppm to 372 ppm, with the higher readings closer to the surface, potentially indicating surficial spillage from pumping. Immediately before the tank was removed from the grave, a second set of readings were taken between 1.5' and 6', ranging between 262 ppm and 553 ppm, with the highest reading at the bottom of the east end of the tank. The soils reading above the allowable limits for backfill, A. Aaron & Sons, Inc. prepared a storage site at the rear of the property. Excavated soils were piled upon two layers of 6 mil poly, and covered with a single layer, with clean fill laid on the top edges to hold the plastic down.

The highway garage had utilized a 1000 gallon skid tank for gasoline purposes subsequent to the abandonment of the gasoline UST, which was located next to the building, and which was disconnected and relocated prior to the full removal of the UST. Following the removal of the tank, samples of the soil were taken from the gravesite at a depth of approximately 6', within plastic bags, and removed to an area where there was no contamination in the air. The readings from these samples ranged from 82 ppm to 466 ppm. These results showed that the soil was least contaminated on the south face of the grave, and concentrated on the north and east faces.

Removal of the contaminated soil continued, with the approval of Sue Thayer of the UST program, who did not advocate the application of fertilizer to the stockpiled soils. As the removed tank initially appeared to be in good condition, it was thought that perhaps an earlier tank, which had been removed some 20 years ago, and replaced with this tank currently being removed, had been the cause of contamination, or that the adjacent diesel fuel tank was perhaps now leaking. During the early afternoon, a soil sample was removed from the west face located near the diesel tank, yet to be uncovered, and the reading was found to be 46 ppm. This lower reading, coupled with no apparent staining, disclaimed the possibility that the contamination was caused by the adjacent diesel tank, which is intended to remain in use until closure scheduled for 1997.

The removal of the contaminated soil continued until 3:30 pm, when it began to rain heavily. The 12' by 24' excavation, approximately 11' deep, was covered with six mil poly at this time, to avoid rainwater contamination. Messages were left with Ms. Thayer to the effect that we had not as yet determined the extent of contamination. There was approximately 75 cubic yards of contaminated soil removed and stockpiled onsite in the first day.

The following day, July 16, 1996, was mostly sunny, warm and humid with light rain in the late afternoon. Work continued at 8:00 am with the pumping of the water that had accumulated on the top of the plastic that covered the excavation, measured to be free of any contamination. Agway came to relocate the proximate diesel pump so that the contaminated soil underneath could be removed. Contaminated soil from the bottom of the grave continued to be removed and stockpiled. Conversations with both Sue Thayer and Chuck Schwer, Sites Management Section Chief, centered upon continued contaminated soils removal. The initial response was to replace the contaminated stockpiled soils, however it was decided to continue excavations for a short time to determine if the edges of contamination could be determined.

Readings taken around the excavation at approximately 15' in depth ranged from 12 ppm to 494 ppm, with the higher concentrations evident at the eastern side. More careful inspection of the removed tank, which was at this point at the A. Aaron & Sons, Inc. facility, displayed evident holes and apparent leakage, more prominently on one end, which was located to the east, with the land slope generally downgradient from there. At this point, the excavations concentrated on this eastern face, while the entire pit was scraped to approximately 17' deep. Below the 12' depth in the eastern side of the pit, a denser clay material was noted, and readings indicated in this location that levels were lower below this interface, being above 400 ppm at the 12' level, and below 100 ppm at the 15 to 17' level. This side of the pit was further removed toward Willow Road at the 12' depth, in the hopes that the limits of contamination could be found. Though higher readings were evident along the northerly face of the pit, excavation of these contaminated soils is impossible due to the location of the garage and fencing.


The final configuration of the excavation, seen on the enclosed site diagram, was 40' by 16' by approximately 17' deep. No groundwater nor ledge was encountered at this depth. Having performed work on an UST closure at the nearby Molly Stark Elementary School this past winter, during which groundwater was encountered, we estimate that the depth to groundwater in this location is approximately 25' below surface. The final readings taken within the excavation ranged from 6 ppm to 158 ppm, with the only readings higher than 100 ppm at the building foundation. The final average reading was 45 ppm. Approximately 250 cubic yards of contaminated soils have been encapsulated onsite. The excavation has been filled with clean native material from a recent on-site excavation and processed gravel toward the surface.

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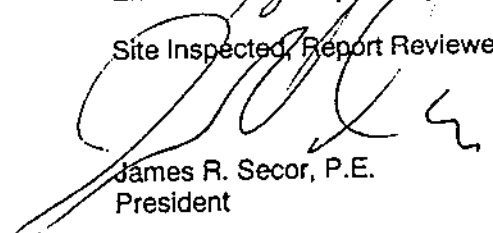
We believe, save for the readings noted at the building interface, that we have removed the more heavily contaminated soils to within reasonable limits. We await consultation with the Sites Management Section to ascertain recommended monitoring and/or corrective action.

Should you require additional information or clarification, please do not hesitate to contact us.

Respectfully submitted,


Toni M. King
Environmental Project Engineer

Site Inspected, Report Reviewed and Approved By,


James R. Secor, P.E.
President

c: Joe Sokul, Town of Bennington Public Works Director
Jim Davis, A. Aaron & Sons, Inc.

**TOWN OF BENNINGTON
WILLOW ROAD HIGHWAY GARAGE
DRILLING LOGS**

SUBSURFACE INVESTIGATION OF FORMER SITE OF 1,000-GALLON GASOLINE UST

January 15, 1997

Page 1

The following drilling logs were prepared by Dean A. Grover, P.E. of Heindel and Noyes, who supervised installation of monitoring wells installed by Tri-State Drilling and Boring on January 15 and 16, 1997. An H-Nu photoionization detector, equipped with a 10.2 electron volt lamp was used to screen split-spoon samples for volatile organic hydrocarbons. All samples were equilibrated in Ziploc bags and warmed to approximately room temperature before PID screening was performed. All wells were completed with flush-mounted curb boxes, cemented in place.

All monitoring wells were installed using 2-inch diameter flush-threaded factory-slotted PVC pipe with 0.020-inch screened slots. Sand packed intervals were installed using No. 1 filter sand and bentonite seals were installed with hole plug bentonite chips.

MW-1

Location: Upgradient well to north of highway garage.

5 - 7'	Medium brown and black (peppery) medium sand with silt horizons; pebbly; loose; dry. PID = 0.3
10 - 12'	Medium brown silty fine sand with pebbles, medium dense, moist. PID = 0.2
15 - 17'	Same as above with more and larger pebbles; saturated. PID = 0.2
20 - 21'	Medium brown silty very fine sand with pebbles; medium dense; wet. PID = 0.2
	At 21', refusal on bedrock or large boulder.

Well Completion Notes:

0 - 4'	Fill.
4 - 6'	Bentonite seal (chips).
6 - 20'	Sand pack.
8 - 20'	Screened interval.

**TOWN OF BENNINGTON
WILLOW ROAD HIGHWAY GARAGE
DRILLING LOGS**

SUBSURFACE INVESTIGATION OF FORMER SITE OF 1,000-GALLON GASOLINE UST

January 15, 1997

Page 2

MW-2

Location: Approximately 20 feet south of the south wall of the highway garage, directly downgradient from the former 1,000-gallon UST site.

~ 3'	Faint gasoline odor
5 - 6'	Medium brown silt with very fine sand and pebbles; medium dense; dry. PID = 0.5
10 - 12'	Same as above; moist. PID = 2.0
15 - 17'	Same as above; wet. PID = 5 - 7
20 - 22'	Same as above; wet. PID = 1.5 - 2

Well Completion Notes:

0 - 5'	Fill.
5 - 7'	Bentonite seal.
7 - 20'	Sand pack.
9 - 19'	Screened interval.

MW-3

Location: 50 feet southeast of former UST location.

5 - 7'	Medium brown silt with very fine sand; few pebbles; moderately dense; moist. PID = 1.6
10 - 12'	Same as above but wet. PID = 0.5
15 - 17'	Same as above with fine sand; PID = 0

Well Completion Notes:

0 - 2'	Fill.
2 - 4'	Bentonite seal.
4 - 16'	Sand pack.
6 - 16'	Screened interval.

**TOWN OF BENNINGTON
WILLOW ROAD HIGHWAY GARAGE
DRILLING LOGS**

SUBSURFACE INVESTIGATION OF FORMER SITE OF 1,000-GALLON GASOLINE UST

January 15, 1997

Page 3

MW-4

Location: Across Willow Road and 120 feet southeast of former UST location.

5 - 7'	Medium brown silty fine sand with pebbles, to greater than 2"; medium dense; moist. PID = 0
10 - 12'	Brown and gray silty fine sand overlain by gravel and pebble streaks; medium dense; moist. PID = 1.2
15 - 17'	Brown uniform silt and very fine sand; moderately dense; wet. PID = 0.6
Well Completion Notes:	
0 - 3'	Fill.
3 - 5'	Bentonite seal.
5 - 17'	Sand pack.
7 - 17'	Screened interval.

[U:\DGR\VERIWP\DOCS\TP-BENNINGTON]

SOIL PROBE LOG

TRI STATE
DRILLING & BORING, INC.
RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

TYPE	_____	SAMPLER	_____	SOIL	_____
SIZE	_____	Continuous	_____	Saturated	_____
HAMMER	_____		_____	Wet	_____
FALL	_____		_____	Moist	_____
				Damp	_____
				Slightly Damp	_____

DATE STARTED: 01/15/97

DATE COMPLETED: 01/15/97

FOOTAGE
DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

6 12 18 24

5-7'	3	3	3	5	20"
10-12'	5	6	6	2	10"
15-17'	5	5	9	5	7"
20-22'	3	3	4	3	22"

Dry Olive brown very fine pebbly sand.
No gas odor. Top 2' to 4' very strong gas odor.

Moist Same as above.

Moist Same as above, a little wetter.

Wet Same as above.

Screen 19' to 9', Riser to surface,
#1 Sand 20' to 7', Chips to 5', Fill to surface.

Client: Town Garage, ~~Willard St.~~ ^{Willow Rd.}
Job Location: Bennington, VT.
Engineers: Wagner Hiendel & Noyes
Inspector: Dean Grover

Driller: Neal S Faulkner
Helper: Ed Jarrosak
Materials: 10' Screen, 10' Riser
1 Cap, 1 Lock Plug, 4 Sand, 1 Hole Plug,
1 Road Box.

SOIL PROBE LOG

MW-----#3

TRI STATE
DRILLING & BORING, INC.
RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

		SAMPLER	SOIL
		Continuous	Saturated
TYPE	_____	_____	Wet
SIZE	_____	_____	Moist
HAMMER	_____	_____	Damp
FALL	_____	_____	Slightly Damp

DATE STARTED: 01/16/97

DATE COMPLETED: 01/16/97

FOOTAGE		DRILLER'S NOTES & COMMENTS
DEPTH	BLOW COUNTS REC	
6	12 18 24	

[illegible]

Client: Town Garage, ~~Willard St.~~ *Willow Rd.*
Job Location: Bennington, VT.
Engineer: Wagner Hiendel & Noyes
Inspector: Dean Grover

Driller: Neal S. Faulkner
Helper: Ed Jarrosak
Materials: 10' 10 Slot Screen, 5' Riser,
1 PVC Cap, 1 Lock Plug, 3 #1 Sand,

SOIL PROBE LOG

Page 4 of 4
MW_#4
Boring_____

TRI STATE
DRILLING & BORING, INC.
RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

		SAMPLER	SOIL
		Continuous	Saturated
TYPE	SS		Wet
SIZE	3"		Moist
HAMMER	140		Damp
FALL	30"		Slightly Damp

DATE STARTED: 01/16/97

DATE COMPLETED: 01/16/97

FOOTAGE
DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

6 12 18 24

5-7'	6	10	13	15	20"
10-12'	8	10	10	10	18"
15-17'	5	6	6	5	20"

Moist Light brown fine sandy gravel, slightly angular.
Moist Very fine silty sand & gravel.
Wet Very fine silty sand.
Augered to 17'.

Screen 17' to 7', Riser to surface,
#1 Sand 17' to 5', Chips to 3', Fill to surface.

Winn Rd.

Project: Town Garage, Willard St.
Location: Bennington, VT.
Engineer: Wagner Hiendel & Noyes
Inspector: Dean Grover

Driller: Neal S. Faulkner
Helper: Ed Jarrosak
Materials: 10' Screen, 10' Riser
1 PVC Caps, 1 Lock Plug, 3 #1 Sand,
1 Hole Plug, 1 Road Box.



ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Heindel and Noyes
PROJECT NAME: MSK/Willow
REPORT DATE: February 6, 1997
DATE SAMPLED: January 23, 1997

PROJECT CODE: HNMW1824
REF.#: 99,259 - 99,263

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures

**ENDYNE, INC.****Laboratory Services**

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

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EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Heindel and Noyes
PROJECT NAME: MSK/Willow
CLIENT PROJ. #: NI

DATE RECEIVED: January 27, 1997
REPORT DATE: February 6, 1997
PROJECT CODE: HNMW1824

Ref. #:	99,259	99,260	99,261	99,262	99,263
Site:	MW 1	MW 2	MW 3	MW 4	Trip Blank
Date Sampled:	1/23/97	1/23/97	1/23/97	1/23/97	1/23/97
Time Sampled:	9:30	9:50	10:05	10:20	8:00
Sampler:	C. Aldrich	C. Aldrich	C. Aldrich	C. Aldrich	C. Aldrich
Date Analyzed:	2/1/97	2/4/97	2/3/97	2/3/97	2/1/97
UIP Count:	8	>10	5	6	>10
Dil. Factor (%):	100	5	100	100	100
Surr % Rec. (%):	95	105	96	101	84
Parameter	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)
Benzene	TBQ <1	740.	<1	<1	TBQ <1
Chlorobenzene	<1	<20	<1	<1	<1
1,2-Dichlorobenzene	<1	<20	<1	<1	<1
1,3-Dichlorobenzene	<1	<20	<1	<1	<1
1,4-Dichlorobenzene	<1	<20	<1	<1	<1
Ethylbenzene	1.1	207.	<1	TBQ <1	<1
Toluene	1.2	1,430.	<1	TBQ <1	TBQ <1
Xylenes	5.4	2,840.	1.0	2.6	3.5
MTBE	<10	<200	<10	<10	<10

Note: UIP = Unidentified Peaks TBQ = Trace Below Quantitation NI = Not Indicated

CHAIN-OF-CUSTODY RECORD

Project Name: MSK/Willow	Reporting Address: H+N	Billing Address: H+N
Site Location: Bennington, VT		
Endyne Project Number: HNMW 1824	Company: H+N	Sampler Name: Chris Aldrich
	Contact Name/Phone #: D. GRAY 6580820	Phone #: 6580820

[illegible]

Relinquished by: Signature <i>Chae Alden</i>	Received by: Signature <i>James M. Chambers</i>	Date/Time <i>1-27-97 10:30</i>
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes ☐ No ☒

Requested Analyses

New York State Project: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			Requested Analyses								
1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD ₅	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

Following is activity related to project updates during the past week. We continue to welcome updates from ANY OF YOU.

[illegible]